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EXAMINER	
YAM, STEPHEN K	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 02/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PS

Office Action Summary	Application No.	Applicant(s)	
	09/806,704	PALME ET AL.	
	Examiner	Art Unit	
	Stephen Yam	2878	

-- The MAILING DATE of this communication appears on the cover sh t with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 27 November 2002 .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 20-44 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 20-40,43 and 44 is/are rejected.

7)☒ Claim(s) 41 and 42 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 17 November 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

This action is in response to Amendments and remarks filed on November 27, 2002. Claims 20-44 are currently pending.

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on November 19, 2002 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Claim Objections

1. Claims 24, 32, 37-40, 43, and 44 are objected to because of the following informalities:

In Claim 24, line 3, the claim language recites the spectrometer outputting "the particular wavelength" which is just a particular characteristic inherent in light- a more definitive term such as " a portion of the output signal at the particular wavelength" should be used.

In Claim 32, "the driving means" and "the control signal from the controlling and processing means" lack proper antecedent basis.

In Claims 37-40, "the combining means" lacks proper antecedent basis.

In Claims 38 and 40 (as dependent from Claim 35), "the calibrated wavelength optical signal" lacks proper antecedent basis.

In Claim 40, line 3, "with" should be inserted after "optical signal" for grammatical correctness.

In Claims 43 and 44, "the calibration reference" lacks proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 20-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanimoto et al. US Patent No. 6,069,697.

Regarding Claims 20, 21, 22, 24, 25, 31, 34, and 35, Tanimoto et al. teach (see Fig. 1) a system comprising means (5, 6, 7, 8) for converting an optical signal (into (4)) for a particular wavelength (see Col. 1, lines 64-67 and Col. 6, lines 7-13) from the multi-wavelength (WDM- see Col. 1, lines 15-20) system to an electrical signal and means for processing (12) the electrical signal to determine the (see Col. 6, line 55 to Col. 7, line 2) performance of the multi-wavelength system and for controlling (14) the converting means so that each particular wavelength of the multi-wavelength system is processed (see Col. 7, lines 61-63). Regarding Claim 21, Tanimoto et al. teach (see Fig. 1) the converting means comprising a narrow-band tunable bandpass filter (6, 7) having the optical signal as an input and the electrical signal as an output (see Col. 6, lines 7-17). Regarding Claim 22, Tanimoto et al. teach (see Fig. 1) the converting means comprising an optical unit (6) having the optical signal as an input and the particular wavelength as an output

(see Col. 6, lines 7-13). Regarding Claim 24, Tanimoto et al. teach the optical unit comprising a grating spectrometer (see Col. 6, lines 4-13) having the optical signal as input and providing a portion of the optical signal at the particular wavelength as an output. Regarding Claim 25, Tanimoto et al. teach (see Fig. 1) a movable grating (6a) having a wavelength range (see Col. 2, lines 16-18) for the multi-wavelength system, where the movement of the movable grating selects the particular wavelength (see Col. 6, lines 10-13). Tanimoto et al. also teach the spectrometer as a Littrow system (see Col. 6, lines 4-6). From Applicant's provided references on the basic embodiment of a Littrow system ("Diffraction Grating Handbook, 5th Ed. By Palmer- http://www.gratinglab.com), a Littrow spectrometer inherently contains (see Fig. 6-4) a mirror that performs as an imaging element for reflecting the optical signal and a beam deflection system mounted such that the incident and exiting optical signals are essentially symmetrical and the optical signal subjected to multiple passes (from the mirror towards the grating and from the grating back towards the mirror) between the grating and the imaging element. Regarding Claim 31, Tanimoto et al. teach (see Fig. 1) means (14) for moving the angular position of the grating to select the particular wavelength (see Col. 8, lines 20-29). Regarding Claim 34, Tanimoto et al. also teach (see Fig. 3) the converting means comprising means (15) for mixing an optical signal (wavelength-specific transmission characteristics of object (15)) with a reference optical signal (out of (1)) to produce a combined optical signal, and a photodetector (7) (see Col. 6, lines 14-17) for converting the combined optical signal to the electrical signal. Regarding Claim 35, Tanimoto et al. teach (see Fig. 3) the mixing means comprising a tunable laser (1) for providing the tunable reference signal under control (13) of the processing and controlling means (12), means (21) for selectively polarizing the tunable

reference optical signal to produce a polarized reference optical signal in one of two orthogonally polarized states (using the $\lambda/2$ and $\lambda/4$ plates- see Col. 8, line 65 to Col. 9, line 10), and means (15) for combining the optical signal and the polarized reference optical signal to produce the combined optical signal. Tanimoto et al. do not teach the system for DWDM signals. It is well known in the art that a WDM system is vastly similar to a DWDM system except for the specific optical characteristics of the transmitted light signals, and that components are often shared between the two system types. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the system of Tanimoto et al. for processing DWDM signals, to provide performance evaluation for a newer and higher-bandwidth transmission system while using the same underlying principles as WDM.

Regarding Claim 23, Tanimoto et al. teach the system as taught in Claim 22, according to the appropriate paragraph above. Tanimoto et al. do not teach a lowpass filter connected to the output of the photodetector. It is well known to use electrical lowpass filters connected to photodetectors to stabilize and contain the detected signal. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a lowpass filter connected to the output of the photodetector and producing an electrical signal output in the system of Tanimoto et al., to stabilize the detected signal and prevent external noise from affecting the detection performance and performance evaluation.

Regarding Claim 26, Tanimoto et al. teach the system as taught in Claim 25, according to the appropriate paragraph above. Tanimoto et al. also teach the beam deflection system by approximation in a Littrow system (see Col. 6, lines 4-6). According to Applicant's provided documents ("The Optics of Spectroscopy" by Lerner and Levinson) regarding a Fastie-Ebert

configuration, a Fastie-Ebert instrument consists of one large spherical mirror and one plane diffraction grating (see Section 2.2 and Fig. 6)- hence, a Littrow system (seen in Fig. 6-4 of "Diffraction Grating Handbook, 5th Ed. By Palmer) is a Fastie-Ebert instrument and since Tanimoto et al. teaches a Littrow spectrometer, the spectrometer of Tanimoto et al. is also a Fastie-Ebert instrument. Tanimoto et al. do not teach the beam deflection system in a combined array. It is well known to use an array spectrometer for outputting light of multiple wavelengths in multiple beams. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a combined array for the beam deflection system in Tanimoto et al., to simultaneously analyze multiple wavelengths in a specific range to improve efficiency and performance evaluation speed.

Regarding Claim 27, Tanimoto et al. teach the system as taught in Claim 25, according to the appropriate paragraph above. Tanimoto et al. do not teach a dielectric optical filter between the movable grating and the imaging element. It is well known in the art to use a dielectric optical filter to provide additional filtering of unwanted wavelengths of light, ensuring that only a specific wavelength is emitted from a spectrometer system. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a dielectric optical filter in the spectrimeter of Tanimoto et al., to provide additional optical wavelength filtering and prevent light outside the specified range from affecting the photodetection process and the results of the monitoring system.

Regarding Claim 28, Tanimoto et al. teach the system as taught in Claim 25, according to the appropriate paragraph above. Tanimoto et al. do not teach the grating as a ruled or blazed grating. It is design choice as to what specific grating is used in the spectrometer device,

according to the specific operational properties are desired. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a ruled or blazed grating in the system of Tanimoto et al., to use specific characteristics intrinsic to each grating to positively affect the spectrometry settings of the system.

Regarding Claim 29, Tanimoto et al. teach the system as taught in Claim 25, according to the appropriate paragraph above. Tanimoto et al. also teach (see Col. 7, lines 9-15) rotating the movable grating to a specific angular position according to a signal from the processing section, the angular position determining the particular wavelength outputted form the spectrometer. Tanimoto et al. do not teach means for determining an angular position of the movable grating. It is well known in the art that sensors are used to determine the position of a rotating device, where specific and precise control of an angle of rotation is required in a scientific instrument. It would have been obvious to one of ordinary skill in the art at the time the invention was made to comprise means for determining the angular position of the movable grating in the system of Tanimoto et al., to precisely control the outputted wavelength for the spectrometer, as desired by Tanimoto et al. (see Col. 7, lines 9-15), as dependent on the angular position of the movable grating.

Regarding Claims 30 and 33, Tanimoto et al. teach the system as taught in Claim 29, according to the appropriate paragraph above. Tanimoto et al. also teach (see Fig. 1) a precision light source (1) for generating a focused beam (into (4)). Tanimoto et al. do not teach a reflecting surface or a position sensor for determining the angular position. Regarding Claim 33, Tanimoto et al. do not teach an incremental scale for influencing the intensity of a reflected focused beam or a detector for detecting the intensity of light from the incremental scale. It is

design choice to use any angle-detecting system to detect the angle of a rotating plane, and it is well known in the art to use a reflective surface and a photodetector in combination with a scale, where the angle of rotation affects the intensity of light detected by the detector. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a reflecting surface and position sensor with a scale and photodetector to determine the angular position of the grating in the system of Tanimoto et al., to utilize a well-known and easily-implemented method of detecting the angle of a rotating component.

Regarding Claim 32, Tanimoto et al. teach the system as taught in Claim 31, according to the appropriate paragraph above. Tanimoto et al. teach (see Col. 7, lines 9-15) a control signal from the controlling and processing means for changing the angle of the grating. Tanimoto et al. do not teach a drive motor, a spring-mass array with torsion bars capable of oscillating coupled to the drive motor, or means for driving the drive motor. It is well known in the art to use drive motors and spring-mass arrays to physically rotate a component in a system, and to use a power supply to provide power to drive the drive motor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a drive motor, spring-mass array, and means for driving the drive motor in the system of Tanimoto et al., to provide electrical control of the angular movement of the movable grating for an automated calibration and testing process.

Regarding Claims 36, 37, and 39, Tanimoto et al. teach the system as taught in Claim 35, according to the appropriate paragraph above. Tanimoto et al. also teach (see Fig. 6) a wavelength calibrator (22) for providing a calibrated wavelength optical signal (out of 22) to irradiate the photodetector. Regarding Claim 37, Tanimoto et al. teach the combining means

comprising simultaneous irradiation of the photodetector by the optical signal and the reference optical signal (see Fig. 3). Regarding Claim 39, Tanimoto et al. teach (see Fig. 3) a first optical coupler (15) for combining the optical signal and the polarized reference optical signal. Tanimoto et al. do not teach the wavelength calibrator used with the polarized reference optical signal. It is design choice to include the wavelength calibrator along with the selective-polarizing means to provide further calibration capabilities. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the calibrated wavelength optical signal with the system of Tanimoto et al. as taught in Claim 35, to both detect wavelength-polarization characteristics (see Col. 9, lines 22-26) and provide wavelength calibration (see Col. 11, lines 30-34) in a single system.

Regarding Claims 38 and 40, Tanimoto et al. teach the system as taught in Claims 37 and 39, according to the appropriate paragraph above. Tanimoto et al. also teach an optical switch (24) to output either the reference optical signal or the calibrated wavelength optical signal. Tanimoto et al. do not teach the simultaneous irradiation with the optical signal, polarized reference optical signal, and calibrated wavelength optical signal, or a second optical coupler to couple the calibrated wavelength optical signal to the other two signals. It is well known in the art to combine multiple signals into a single combined optical signal, to perform multiple tasks using a single optical signal stream. It would have been obvious to one of ordinary skill in the art at the time the invention was made to irradiate the photodetector with all three signals and use a second coupler to combine the calibrated wavelength optical signal with the other two signals by using a coupler instead of a switch in the system of Tanimoto et al., to provide simultaneous

wavelength calibration and determine wavelength-polarization characteristics while still attached to the optical device (15).

3. Claims 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanimoto et al. in view of Cliche et al. US Patent No. 5,780,843.

Tanimoto et al. teach the system as taught in Claim 36, according to the appropriate paragraph above. Tanimoto et al. do not teach an absorption cell having a calibrated wavelength spectrum or an interferometer array including a supplementary light source. Cliche et al. teach a laser for a WDM system (see Col. 1, lines 18-20) using an absorption cell (12) having a calibrated wavelength spectrum (see Col. 5, lines 24-26) or an interferometer (see Col. 8, lines 2-7) with a supplementary light source (11) (see Fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the absorption cell or interferometer of Cliche et al. in the system of Tanimoto et al., to provide a fixed and predetermined wavelength calibrated wavelength optical signal as desired by Tanimoto et al. (see Col. 9, lines 37-39).

Allowable Subject Matter

4. Claims 41 and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: The invention as claimed, specifically in combination with dividing the optical signal into orthogonal polarized beams and combining them to form a single combined beam, is not disclosed or made obvious by the prior art of record.

Response to Arguments

6. Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

7. Examiner agrees with the Applicant's arguments regarding the 35 U.S.C. 112 1^{st} and 2^{nd} rejection and withdraws the rejection.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703)308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7724 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

SY

SY
February 24, 2003

DAVID PORTA
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